

NON-NEONATAL TETANUS IN QUEBEC, CANADA, 1990-2008

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Tetanus

Adult Immunization

Surveillance

Epidemiology and immunization program

- Tetanus vaccine was first approved in Canada in 1940
- Since then the number of tetanus cases drastically declined:
 - 40-50 deaths per year in 1920
 - 1-10 case(s) per year at present, rarely fatal
- A universal immunization program was implemented in the province of Quebec (population 8 mln) in 1949 with recommended:
 - 4 doses of TDaP-Polio-Hib at 2, 4, 6 and 18 months
 - 1 Tdap-Polio dose at 4-6 years
 - 1 Tdap dose at 14-16 years
 - 1 booster dose every ten years or once at 50 years (Td, or one Tdap if ap not previously received)

Current Post-Exposure Prophylaxis protocol

	Minor wound without contamination		Other wounds ¹	
	Vaccine	TIG ²	Vaccine	TIG ²
Complete primary series with written proof ≥ 3 vaccine doses	if last booster dose > 10 years	No	if last booster dose > 5 years	No
Unknown or incomplete primary series < 3 vaccine doses	Yes	No	Yes	Yes

¹ Contaminated wound with dust, soil or animal/human feces, animal or human saliva; penetrating wound (like bites, rusty nails ...) wounds associated with tissue injury and necrosis, chilblain or burn (Quebec Immunization Protocol, 2011)
<http://publications.msss.gouv.qc.ca/acrobat/f/documentation/piq/09-283-02.pdf>

² Tetanus Immunoglobulin

Background and Objectives

- Sporadic cases of tetanus continue to occur in Quebec despite:
 - very high vaccine coverage against tetanus in children
 - recommendation for booster doses in adults

Objectives:

- Estimate the incidence of tetanus in Quebec
- Review its clinical presentation
- Identify risk factors associated with its occurrence

Methods

- Tetanus cases hospitalized between April 1st, 1990 and March 31st, 2008, identified from:
 - Provincial hospital discharge database (Med-Echo)
 - Notifiable disease registry (MADO)
- Diagnostic codes used :
 - ICD-9 code: 037 (tetanus)
 - ICD-10 codes: A34 (obstetrical tetanus), A35 (tetanus)
- Medical charts were reviewed by three independent reviewers. Consensus had to be reached to validate a case
- Information was collected with a standardized form

Number of cases and incidence of tetanus

- Cases identified and reviewed:

- 36 potential cases identified
- 23 confirmed as tetanus
 - 21 medical charts available for review
 - 2 confirmed cases upon other available documents

- Incidence and case fatality:

- We observed an average of 1.3 cases/year and an incidence of 0.17 per million person-years
- No cases occurred during winter months (Dec. Jan. and Feb.)
- Two cases died (lethality of 8.6%)
- Only 14 cases (61%) had been notified to the public health authorities

Tetanus incidence by age group, Quebec, Canada 1990-2008:

Age (in year) at wound onset	Rate per 100 000 p-y
< 20	0.3
20-34	2.5
35-49	1.2
50-64	3.1
65+	2.4
Total	1.7

Age and sex distribution of cases

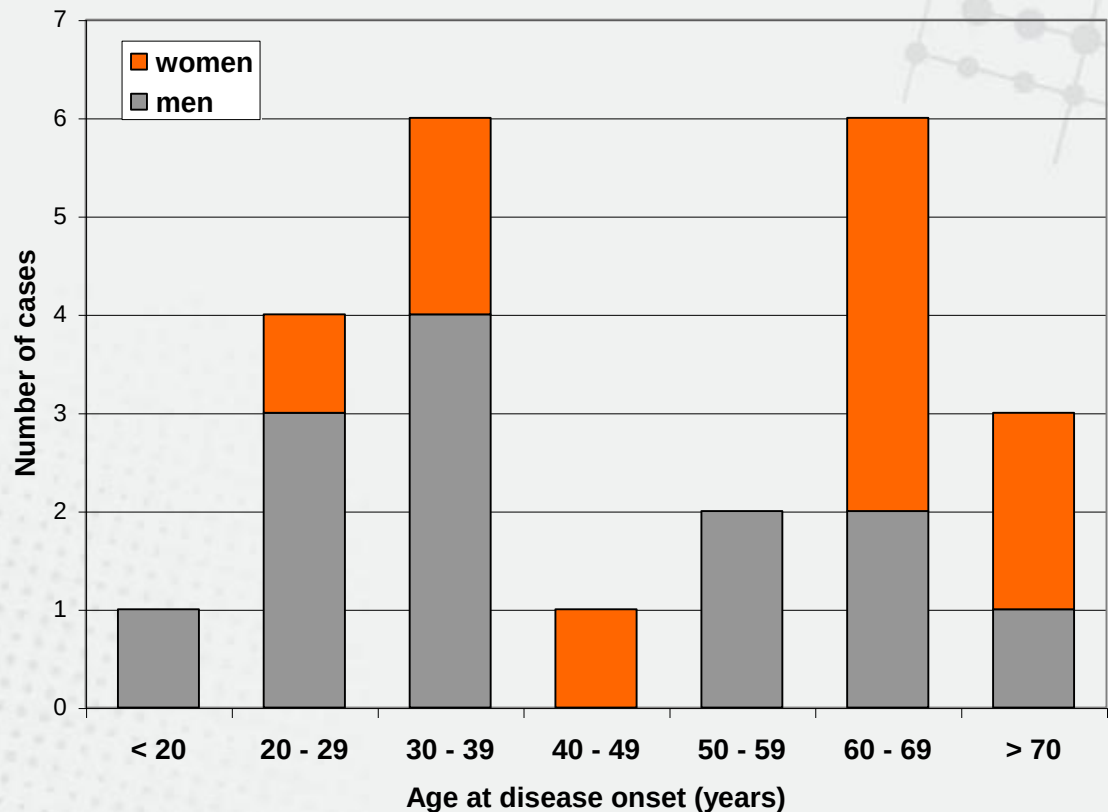
- **Gender:**

- Both gender were affected
- Men were younger at diagnosis
 - 39 vs. 54 years of age

- **Age:**

- Median age was 42 years (range: 18 to 83y)
- 62% of cases <60 years old

Age and sex distribution of tetanus cases, Quebec, Canada 1990-2008:



Potential sources of infection

- Potential source of infection were identified in 19/21 cases (90%)
- Of those 19 patients, 24 separate wounds were reported:
 - 7 chronic wounds (ulcers or skin lesions)
 - 17 traumatic injuries
 - 15 cases had at least one traumatic injury
- 9 cases sought medical care for their wound
- 2 cases with chronic wound were under medical care
- 3 cases developed tetanus during hospitalization

Circumstances of exposure

Circumstances of injury in tetanus cases:

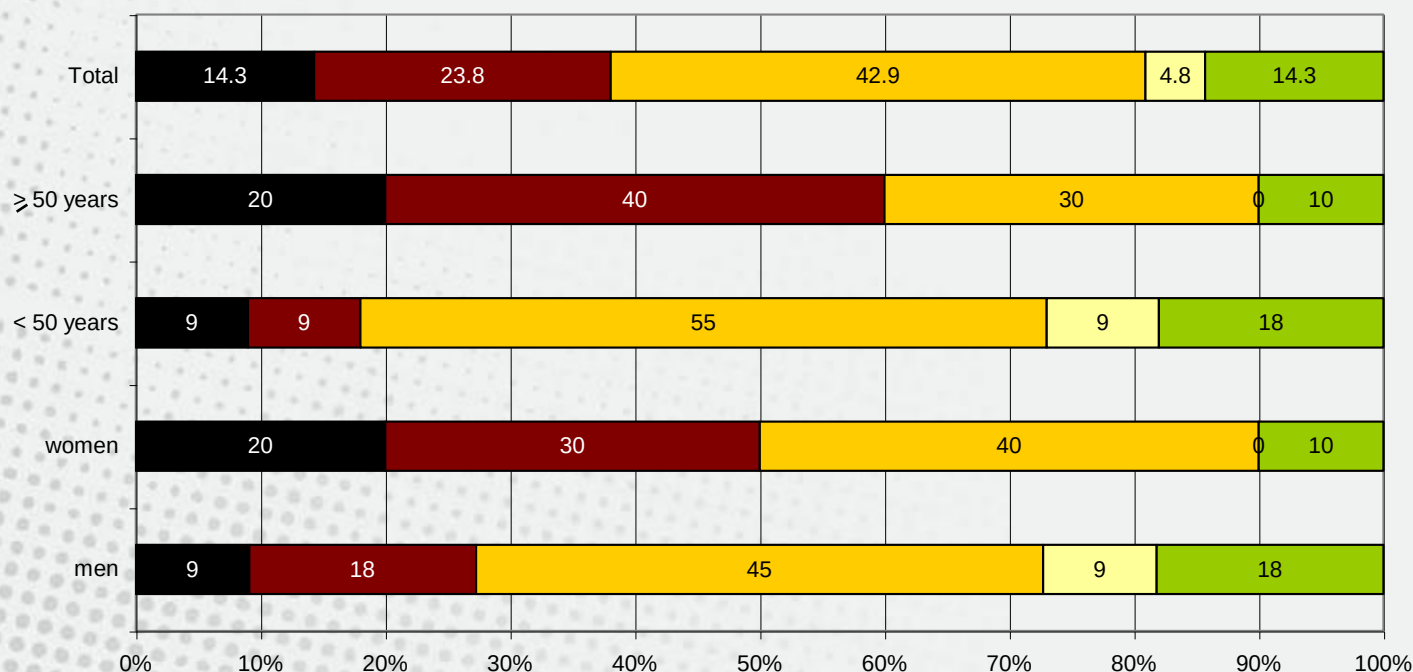
	Wounds n=24 (%)
Manual labor	6 (25)
Wound involving rusty nail (no consultation)	2 (8,3)
Wound while traveling in foreign country	2 (8,3)
Accident involving motor-driven vehicle	2 (8,3)
Special situation involving fight and random shot	2 (8,3)
Skin diseases (herpes labialis, psoriasis, ulcers ...)	7 (29,2)
Burn	2 (8,3)
Stomach surgery (among other wounds)	1 (4,2)

- The 2 cases without injury were especially questioned (at hospital) about gardening activities.
- One case was IDU

Immunization status of cases

- 81% of cases occurred in patients who were not up-to-date with their immunization
 - 24% had never been immunized

Immunization status of tetanus cases, reported by sex and age group:



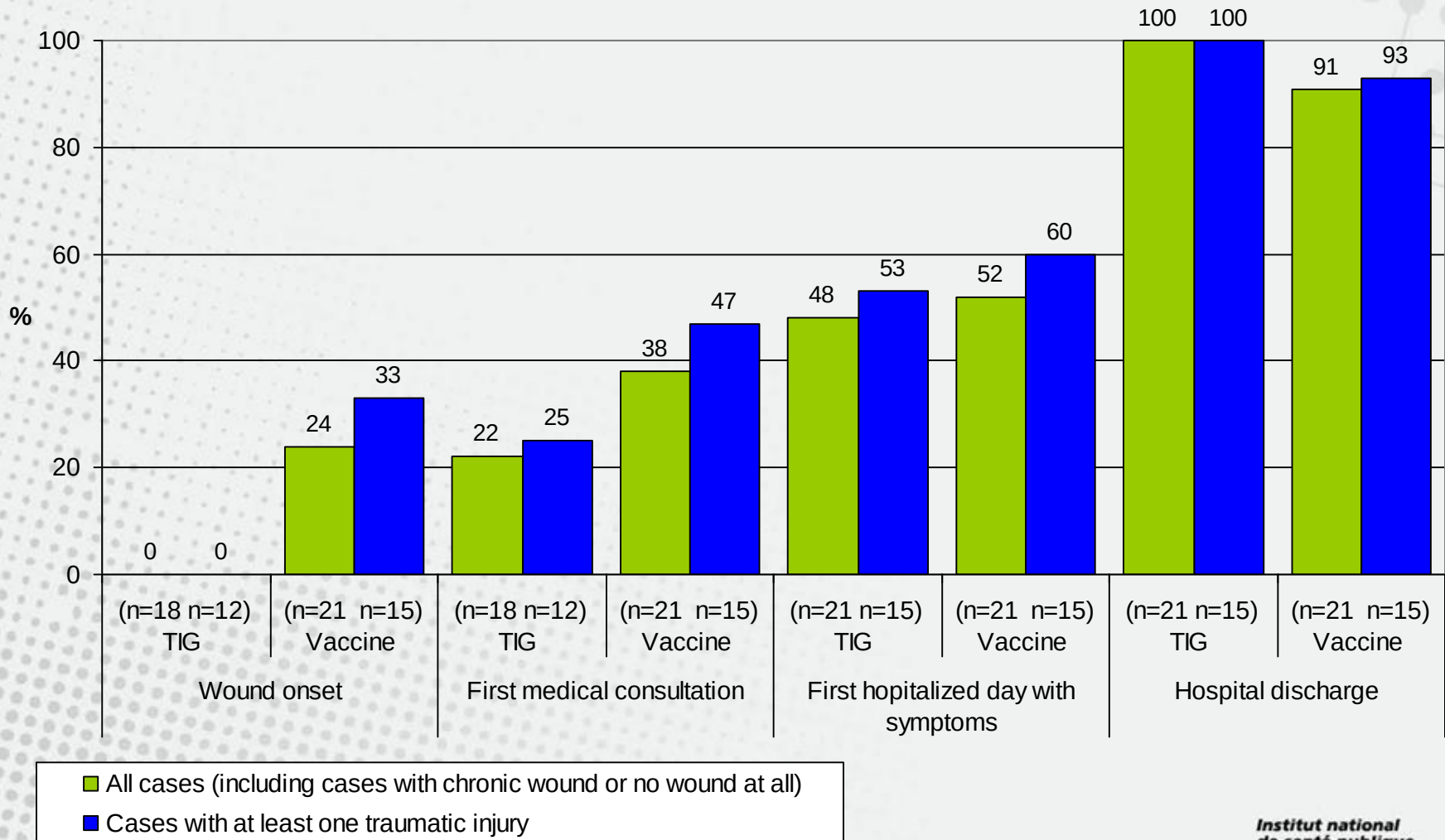
- Not registered in patient medical chart
- Not vaccinated
- No vaccine dose received in previous ten years (primary series completed or not)
- Unknown primary series and less than 5 years since last vaccine dose
- Complete primary series and more than 10 years since last vaccine dose

Administration of TIG and vaccine

(see figure on following slide)

- 21 cases required ≥ 1 dose of vaccine and 18 needed tetanus immunoglobulin (TIG) as part of post-exposure prophylaxis
 - Only 38% received their vaccine & 22% their TIG at first medical consultation
 - 47% and 25% of those with at least one traumatic injury
 - 16% and 16% of cases with chronic wound or no wound at all
- TIG were given very quickly after a tetanus was suspected
 - But in average 7 +/- 6 days after symptoms onset (median = 4.5 days)
- When discharged from the hospital
 - all cases had received TIG
 - 2 individuals (10%) have not received the needed vaccine dose

Administration of TIG and vaccine



Strengths and Limits

- We make an exhaustive census of tetanus cases
 - Combination & validation of notified and hospitalized cases
 - Review of medical charts
- There was some missing information in the medical charts reviewed: immunization status, date of injury etc...
- Exact source of infection is difficult to identify as several cases presented multiple potential sources

Highlights

- We identified areas of concern at every steps of care
 - Most patients were not adequately immunized
 - Many failed to seek medical care
 - Most patients were not adequately prescribed post-exposure prophylaxis (PEP)
 - There was several cases with chronic wounds or without wound at all
 - PEP seemed to be better applied to patients with traumatic injuries
 - Tetanus should not be excluded in wound absence

Conclusion

- National Public Health Program Objective:
 - < 1 tetanus case / 5 year: Not yet achieved
- Recommendations may be issued, taking into account :
 - Risk factors for developing tetanus
 - Definition of high risk wounds for post-exposure prophylaxis : chronic vs traumatic
 - Physician awareness for suspicion of tetanus and PEP compliance
 - Cost-effectiveness of different vaccination strategies to enhance vaccine coverage

Acknowledgments and investigation team

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